THE AMERICAN

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Devoted to Practical X-Ray Work and Allied Arts and Sciences.

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Frederick Strange Kolle, M. D.

The American X-Ray Journal.

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VOL. 6. *ST. LOUIS, FEBRUARY, 1900.* *NO. 2.*

REVIEW OF AN X-RAY DIAGNOSIS.

ABSTRACT OF A PAPER READ BY JOHN DENNIS, BEFORE THE ROENTGEN INSTITUTE, FEB. 1900, AT ROCHESTER, N. Y.

The greater portion of the regular meeting of the Rochester Roentgen Institute, February 3, 1900, was devoted to a paper by the president of the institute, John Dennis. The motive of the paper was a recent x-ray diagnosis and surgical operation for the removal of a bullet, by Dr. W. W. Keen, the report of which appeared in the Philadelphia Medical Journal of January 6, 1900.

At the outset, Mr. Dennis disclaimed any intention of criticising either the surgical operation or the x-ray diagnosis upon which the explorations of the surgeon were based. At the same time, he said, it was such a notable instance of the deceptive and misleading nature of radiographic diagnosis, that he felt impelled to examine the case critically, for the instruction of the members of the institute. Mr. Dennis had taken the pains to reproduce in wood, the conditions at the cross-section as shown in Dr. Keen's paper. He also distributed to the members carbon copies of the cross-section, reproduced from Dr. Keens drawing.

After showing with the Dennis fluorometer the effect of the divergence of the rays, which misled the surgeon and necessitated the extensive explorations, Mr. Dennis quickly made a fluorometric diagnosis, and when the block was separated at the cross-section it was seen that the lines formed passed through the center of the shot, forming four right-angles about the center of the object sought. The process with the fluorometer was so simple that it was repeated at once by members of the institute. An abstract of the paper of President Dennis follows:

"In a very interesting article in the Philadelphia Medical Journal of January 5, 1900, W. W. Keen, M. D., L. L. D., has clearly demonstrated the difficulty of correctly locating foreign substances in the human anatomy. It is not my present intention to review my experience in aiding surgeons in diagnosing cases of this kind by means of the appliance which bears my name, nor to detail the many laboratory experiments which I have made during the past three years with the Dennis fluorometer. I wish just now to call the attention of members of the institute to the difficulty encountered by Dr. Keen, and his experience in exploring for a bullet. In doing so I will quote from Dr. Keen's article. He says:

"The patient brought with him a skiagraph, taken August 18, 1899, by E. W. Ames, A. A. Surgeon, U. S. Army, at the Presidilo San Francisco, Cal. This skiagraph shows the bullet very distinctly posterior to the head of the tibia. It is not, apparently, embedded in the bone.

The skiagraph taken by Mr. Prince, in the Jefferson Hospital, on his admission, confirmed this finding.

"After describing at some length the method adopted to determine the position of the bullet from the skiagraph, Dr. Keen continues:

"Nothing seemed easier that to cut down to a point so exactly indicated, and, by introducing the finger, to detect the bullet at once, and remove it with ease. An incision four inches long was made over the spot indicated, but on introducing my finger no trace of such a projectile could be found on the posterior surface of the tibia. I cut down to the bone itself at three adjacent points and by means of retractors was enabled to look at its posterior surface very clearly, but no bullet was to be seen. I then explored the posterior surface of the tibia, passing my finger between the popliteal vessels and the bone, all the way the external border of the tibia, and still could not find it. After considerable search I again returned to the original place as shown by the skiagraph. The bone was covered at this point by the fibrous insertion of the semimembranous muscle. After incising this I finally came upon the ball, *embedded below the surface of the bone*. With great difficulty I was enabled to pry out and remove it. (The italics are Dr. Keen's.)

Mr. Dennis continued:

"We have here a practical reproduction of the cross-sec ion conditions found in the limb in the case reported by Dr. Keen. It is susceptible of being severed at the cross-section for convenience in placing the shot, and for the purpose of verifying the accuracy of the diagnosis. It should be stated that the human anatomy lends itself more readily to these manipulations than does this rigid block. We will now submit this arrangement to the rays, placing the tube distant twenty-two inches, as in the case reported by Dr. Keen.

"I have prepared this block of wood in such manner as to closely reproduce the cross-section, as shown in the carbon prints you hold. Severing the block at the cross-section, I place a small buckshot at the place of the bullet as indicated in drawing, and replace the block in position.

"Now, referring to the drawing, you will please follow my operation. According to my method, the end sought is to furnish the surgeon at once, without the aid of photography; first with a line around the circumference of the limb, which line shall indicate to the surgeon the cross-section of the limb on which the shot is situated. Second, to furnish him two points, marked on the circumferential line, through which a right line drawn from A to A' would pass through the center of the shot C: third, to furnish two other marks on the circumferential line through which a straight line will pass at right angles to the first right line, through mark B, through shot C, to mark B.

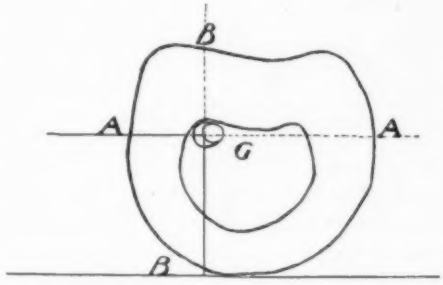
"Recalling my last previous paper, you will see at once that with these guides the surgeon will be enabled by any course which conditions may indicate to explore at once for the shot on established lines and with accurate measurements, with the absolute certainty of finding it at the point indicated. For an x-ray diagnosis which would necessitate explorations to the extent indicated in the extract from Dr. Keen's paper, which I have read, would scarcely reach the standard demanded of members of this Institute.

"Now please follow me closely in order to repeat the operation.

"Selecting this fluorometer piece, which fits loosely over the limb, I place it in the slots of the cross-pieces, its base being even with the top of the table and with the fluoroscope, I adjust the tube so that a symetrical shadow of the fluorometer is shown on the fluoroscope screen with its two arms appearing as one. Placing the block which represents the limb between

the arms of the fluorometer, I move the limb until the shadow of the shot is coincident with the single shadow of the two fluorometer arms. You will see at once that if I amputate the limb, or sever this block at the cross-section indicated by the two fluorometer arms the shot will be found on that cross-section. Closing the block again, I observe with the fluoroscope, and place one of the sight V-shaped pins in such position on the arm of the appliance nearest the fluoroscope in a position where the shadow of the bullet shows in the shadow of the notch of the pin.

Next, laying aside the fluoroscope I place a similar V-shaped pin on the arm of the fluorometer nearest the tube at an equal distance from the base of the fluorometer instrument with the other pin; this, of course, brings the two pins equi-distant from the top of the table. Observing again with the fluoroscope it will be seen that the shadow of the pin nearest the tube will show above the shadow of the opposite pin and shot. I note this difference by means of the fluorometer grating. I then adjust the tube until the shadows of the pins are in line, when the bullet, in this case, will show at a point below the coincident shadows of the pins. Lowering the pins equally the same distance—a distance equal to the difference last noted—and readjusting the tube, we find the two pins and the shot on a straight line, a distance above the table equal to the distance indicated by the pins. I now make a mark on the circumferential line at the pins on either side, and we have the line A A′, passing through C, the shot. And that line is susceptible wherever the patient may be, of being placed horizontal with a table if desired. On a straight line drawn from A to A′ across the cross-section, the shot will be found. Giving the limb a quarter turn, I repeat the operation forming the line B, C, B′ and marking the points of the notches in the pins as before. This line is exactly at right angles with the line A, A′, and also intersects the shot C. "Now let us see: Separating the block again



and projecting across the the cross-section a straight line from the mark A to the mark A′, we find it passes through th e shot. Projecting a line across the cross-section from B to B′, we find it passes through the shot, and is at an exact right angle with the line A, A′.

"In other words, the two lines projected from the surface markings form four right angles of different dimensions about the center of the shot C. The rest is a matter of simple measurement for the surgeon.

"I have gone into this matter somewhat in detail because of the importance of the subject seems to demand it, and because in your hospital practice, as in mine, diagnoses which involve explorations to the extent detailed by Dr. Keen will not be accepted."

At the College of Phys., Philadelphia, Dr. F. F. Stewart presented two slides showing greenstick fractures, Dr. Chas. Leonard presented slides showing renal calculi. Dr. A. H. Cordier showed radiographs of stones which had been purposely placed in the outlets of the pelvis.

Dr. Royal Whitman of New York City in the annals of surgery for February showed an x-ray case of separation of the epiphyses of the head of the femur and also one of coxa vara of the hip in early stage. Another interesting case is shown of a section of the epiphyseal cartilage of the neck of the femur.

SOME LESSONS FROM THE PRACTICAL APPLICATION OF THE ROENTGEN RAYS TO SURGERY.

By John Hall-Edwards, L. R. C. P., F. R. P. S. Surgical Radiographer to the general hospital, Birmingham, president of the Astor Photo. Society: Vice-president B'ham Photo. Society.

Although the x-rays have not at present, (in England) attained that position as an aid to surgery which their importance warrants, there can be no gainsaying the fact that they have taught us many valuable lessons, and are likely to teach us many others. Innovations into the realms of surgery are always received with great caution and some amount of misgiving. No matter how good they are, or in how far they are likely to mitigate suffering, they can only be accepted after a long period of probation, and then they are only allowed to take their place by a process of evolution. This slowness in accepting proved scientific facts, is not in any way due to ignorance, but rather to a general dislike by surgeons to any kind of outside interference.

To the operative surgeon the knife is the panacea for all evils, and anything which offers a chance to patients other than by the knife, is an evil thing. and is not accepted until outside pressure overcomes internal resistance.

Many of our large hospitals, it is true have instituted x-ray departments, but even in these but a small number of the cases which are likely to receive benefit are examined. Hundreds of hospitals have no facilities for the production of radiographs, the practical use of which is either ignored or has never been thought over.

Some surgeons still try to find foreign bodies with the probe, or knife, and in both endeavors as usual fail.

For the discovery and localization of foreign bodies which are more apaque than the flesh or bone, the x-rays are absolutely certain, and in all cases other than in those in which the foreign body can be felt, the adoption of any other method is cruel, inhuman and unscientific.

Although the x-rays have only been applied to surgical work for about three years, so much has been written about them that we would have thought that no surgeon would have been bold enough to "go" for a deep seated bullet without their friendly aid. Yet a few weeks since I saw the report of an inquest upon a patient who had died after three unsuccessful attempts to extract a bullet without the x rays. To rely upon the probe to give satisfactory information is to rely upon a broken reed. The probe as an instrument of precision is absolutely useless, and as a rule is equally dangerous.

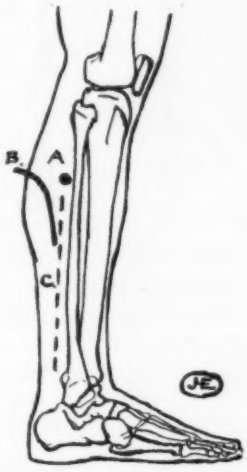
Before the introduction of the x-rays, the restricted use of the probe was necessary, inasmuch as it was the only means at our command for localizing foreign bodies. That many people have been killed by it, there can be no doubt, and the knowledge gained by its use is so small, and unsatisfactory that we should not have been much worse off without it. As a death-dealing instrument (especially on the field of battle) a dirty and unskillfully used probe has few equals, and even in the hands of the practical surgeon its tendency is to give misleading ideas. A probe when once introduced has an inherent desire to go somewhere, and in nine cases out of ten it starts and continues on the wrong track. So frequently is this the case that in my own practice I prefer not to known in which direction the probe has gone.

One of our leading surgeons informed me a few weeks since that the probe had never given him any real knowledge, and that except for the purpose of applying dressings he had entirely discarded its use. One of the highest tributes to the uselessness of the ordinary probe was paid by the introduction of Nelaton's special instrument, for the necessity of the latter was due to the inability of the former to detect a bullet even when touched. The telephone probe is an instrument of the same class, that is to say that with both of them,

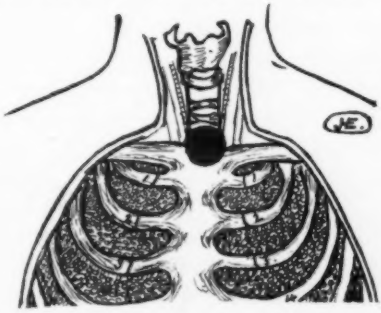
the foreign body "must be discovered before it can be found." A few weeks practical work will suffice to convince any one that the probe is a useless, dangerous and unreliable instrument. I will now quote a couple of cases in points.

X. Z., a young woman was sent to me with a history of having been shot in the head with a small "toy" revolver. The bullet entered just above the left eye, and I was informed that at the time of the accident (some three weeks previously) a probe was passed through the wound into the skull, for a distance of nearly two inches, and that on being withdrawn brain substance was discovered on the point of the probe. A radioscopic examination proved that the bullet had not entered the skull, but was flattened out upon the frontal bone. As to where the probe went in this case, I am unable to even guess.

A. B., a boy of fourteen years of age was accidently shot in the calf of the leg with a "toy" pistol. When sent to me, he had a scar about seven inches in length down the side of the leg, and a drainage tube five inches in length was inserted through the wound caused by the bullet. I was informed that a probe passed directly after the accident went in a downward direction for five or six inches. An operation had been performed and the track of the bullet followed without result. The incision made during the operation was seven inches in length, and is shown on the dotted line in Diagram I. (c.) The drainage tube B. is placed in the track made by the probe whilst the true position of the bullet is shown at A. In order that the tube should show in the radiograph I withdrew it and filled it with iodoform. On showing the radiograph to the surgeon I was informed that it must have moved. The operation for extracting it occupied about five minutes, a two inch incision being ample for the purpose. Proving that the bullet had not moved, was the fact that by the side of it lay a small piece of cloth which had been carried in with it. The probe in this case made a false track and led to a serious operation which might have been avoided had the x-rays been applied in the first instance. I could quote numerous cases of

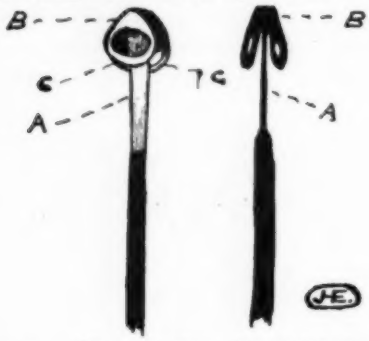


the same sort, but these two are sufficient for my purpose, so I will pass on. During the last two years eighteen cases of coin in esophagus have come under my notice, and there are one or two important lessons to be learned from them. In five of the cases the coin had been in the gullet for periods varying from three months to five weeks without serious consequences. They were all situated in the same position, viz.: on a line with the top of the sternum, and the face of the coin was in each instance turned forwards. (Diagram II.) With the



exception of the first case which came under my notice and which was removed by operation (esophagotomy) they have one and all been removed by means of the coin

catcher within a few minutes of their positions being ascertained by means of the

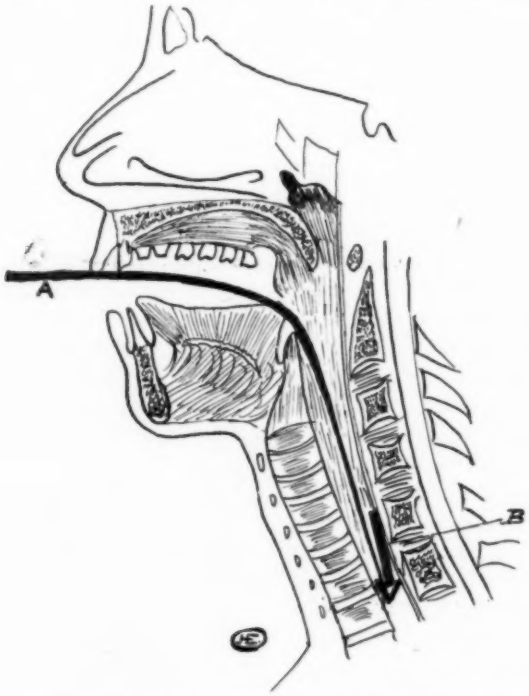


x-rays. After having depreciated one surgical instrument in general use, it is a pleasure to laud another which is generally believed to be useless.

The Coin-Catcher, (Diagram III.) is absolutely certain to achieve the results for which it was designed if properly used. It consists of a whale-bone stem in the ends of which is fixed a piece of watch-spring, A. on the ends of this, on a loose hinge is fixed a minature anchor, which moves freely from one side to the other. When this is passed down the gullet which contains the coin and past the obstruction, one of the free arms (c) (c) pass beneath and behind the coin, so that when the instrument is withdrawn one arm grips the coin and brings it up.

(Diagram IV.) shows the method in which the instrument acts. A. Coin-catcher. B. Coin. Until the discovery of the x-rays the coin-catcher was generally held to be a useless instrument, many surgeons preferring to operate, rather than to try it. The positive knowledge which is gained by means of the fluorescent screen has, however, taught us that it can render invaluable aid.

In several cases which have come under



my notice the coins had been in the escophagus for a lengthy period, with but slight apparent discomfort to the young patients, hence there existed much doubt as to the presence of a foreign body at all, and it was only after the application of the

x-rays that the diagnosis was made a matter of certainty. The difficulty in all cases ascertaining the presence of a coin without the x-ray, leads me to ask: What became of such cases before their introduction? In all probability many patients died without the direct cause having been discovered. A coin left undisturbed would ultimately slough through into the trachea, and the patient would die from a septic pneumonia. I have no doubt that many lives have been spared by the use of the x rays and have no hesitation in recommending the coin-catcher as a most useful and efficient instrument.

It would be an easy matter to point, to many more valuable lessons brought home to us by the x-rays, but as my article has already exceeded its bounds I must defer these for another occasion.

161 Newhall Street, Birmingham, England.

X-Ray Case Book.

We have been asked several times for an atlas of the anatomy of the human body for the purpose of keeping pictoral records of x-ray findings. Late in 1899 David Walsh, M. D., Hon. secretary of the Roentgen Society, London, Eng., published the "X Ray Case Book" for the purpose of noting apparatus, methods and results with full diagrams of the human body and skeleton, together with diagrams for special cases. The sheets are 9 x 12 inches. This is the best thing offered for keeping records of the work of the x ray diagnostician.

The books with 50 sheets can be had for 75c. Orders should be sent to Bailliere, Tindall & Cox. 20 King William Street, Strand W. C., London, Eng.

A series of x-ray articles by competent authorities with many illustrations consumed most of the January 1900 issue of the Philadelphia Medical Journal.

It is significant to notice the number of medical journals that are taking interest in x-ray work this year.

EXCITATION OF THE CROOKES' TUBE BY THE STATIC MACHINE.

CHAHTER 3

Convective Discharges.

BY JOHN T. PITKIN, M. D.

In elementary works upon electricity is usually figured a Leyden jar, having projected from its top a small metallic ball electrically connected to its inner coating. At the same elevation, a few inches to one side is shown a second ball of similar size and composition, supported upon a conductive rod through which it is connected to the outer coating of the condenser.

If the Leyden jar is electrically excited, a small pith ball hanging dependantly by a silken thread suspended equidistantly between the metallic bulbs will be set in motion by the electrical energy of opposite polarity, with which the bulbs are charged, in accordance with the law of attraction and repulsion, i. e. dissimilarly charged bodies attract but similarly charged masses repel each other. The pith ball will vibrate to and fro, carrying with each pulsation an electrical charge from the positive to the negative bulb, then vice versa, these oscillations will continue until the potential of the bulbs is thereby reduced to zero. The foregoing process is given as illustrative of the modus operandi of convective discharges. Between the metallic balls in which the discharging rods of the prime conductors of a static machine terminate, the electrical manifestations are of a similar nature, the pith ball being replaced by the particles of the atmosphere. The length and rapidity of the discharge will depend upon the difference of potential, i. e., pressure or voltage and its character for a given air space, depends upon the quantity or number of lines of force in a given time, i. e. milliamperage of the current. It also determines whether it shall be a spray, a brush or a spark, and if there are lines enough for the last mentioned variety of discharge whether the spark will be thin or fat. An air space through which the electrical current appears to leap is called a spark gap. For

purposes of investigation let us divide such spaces into intrinsic or useful and extrinsic or wasteful. This subdivision will be refered to under another heading, where we will try to prove that only the air gap between the prime conductors of a properly constructed apparatus can be considered beneficial. Should the negative discharging rod of the machine be replaced by a concave aluminum electrode, and the positive rod by a platinum target, and both pole and the intervening air gap be inclosed within a glass bulb from which the air has been nearly exhusted, i. e. a Crookes tube, the convective discharge between the metallic surfaces becomes manifest in the form of x-radiance. The higher the voltage of the exciting apparatus the greater will be the velocity of the inter bulbular molecules and the severer the bombardment of the target placed at proper range in their mean path. The larger the amount of electricity supplied in a given time to the cathodal electrode, providing it is of adequate areal expansion, the larger will be the amount of the convective discharge and consequently the volumn and density of the x-radiance emitted from the reflector.

May we not at least express the hope that the time is not far distant when we can replace our present empirical x-ray methods by others based upon mathematical exactness employing the C. G. S. units of length, mass and time which are now being applied to other branches of the science of electricity, wherewith we will be able to compute the relation between the efficiency of the static generator on the one hand and the Crooke's tube on the other, their mutual adaptation and consequent x-ray usefulness e. g. So many units of pressure or volts capable of developing so many unites of velocity and x units of electrical quantity or milliamperage, giving rise to x units of Crooke's lines of force within a tube of x mycrofarads capacity will develop x units of x rays or so many Roentgens?—BUFFALO, N. Y.

PHOTOGRAPHY IN HOSPITALS AND MEDICAL COLLEGES.

BY PROF. JOSEPH F. SMITH, X-RAY LABORATORY, PRESBYTERIAN HOSPITAL.

Within the last few years many hospitals and medical colleges have been equipped with laboratories and apparatus for the medical and surgical application of the Roentgen ray. These laboratories are, of necessity, under the management of persons more or less skilled in photography, and therefore offer a splendid opportunity for a very useful application of the "older photography" in the collection and preservation of photographs of interesting pathological conditions and specimens. Such a collection of photographs would form a valuable source from which to draw illustrations for medical and surgical works and also serve as useful records of interesting cases. The photographs could be filed with the history sheets and in this way would be readily accessible for reference at any time, or the entire collection might be classified and indexed.

A few words about the outfit suitable for such use may not be out of place. Work will have to be done under all conditions of light (or darkness) on all kinds of subjects and often under the most adverse circumstances. Hence an outfit for such work must be portable, easily manipulated, compact and yet capable of doing any kind of work that a photographer is ever called upon to do.

The camera and support. The tripod should be heavy and firm, capable of supporting the camera with the bellows drawn far out. As work will often have to be done on concrete, marble or other smooth floors, rubber tips, such as those used on crutches will often be found useful.

The camera should be at least 5 x 7 with reversible back, swung inward and falling front and back focus, or better, a camera that may be used either as a front or back focus camera. Often in photographing rather small specimens when a rather large image is desired a back focus feature will be found almost indispensable.

The lens is the most important part of the entire apparatus. It should be extremely rapid, covering at full aperature the plate used, having a flat field and good depth of focus. As the conditions of light are often bad speed is a most desirable quality. One of the modern flat field lenses should invariably be selected and no lens can be found that excels the Soightlaender Collinear for this work. For a 5 x 7 plate a Series II. No. 4 working at an intensity of F 5.6 or a Series II. No. 5 working at F 6.3 will give the best results for general work.

The plate should be the most rapid obtainable. For general work the Cramer Crown will be found entirely satisfactory, and for photographing prepared specimens, dissections, operations, etc., the medium Isochromatic will yield the best results.

CHICAGO, ILL.

To See Around the Corner.

A Boston firm sells, under the name "X-Ray Camera," an apparatus which apparently enables an object to be seen through any opaque substance. It is hardly necessary to say that the x-rays have nothing whatever to do with the phenomenon, which is really produced by a set of four hidden mirrors, that conduct the light around the opaque object.—Ex.

The price of the Rochester Fluorometer has been reduced to meet the wants of the surgeon and physician using x-rays. This essential adjunct to correct x-ray work is sold with the case of instruments and a frame suitable for holding cross pieces and an upright holder for screen and x ray plate also accompanies it. This frame can be used on any table or two tables. We will gladly assist x-ray workers with any information they desire on this subject.

In Cosmos January 6th, is an article of a general nature giving a summary of the development of our knowledge of the x-rays.

PRACTICAL SUGGESTION.

BY J. RUDIS-JICINSKY, A. M., M. D.

It is not necessary to describe and illustrate the recent inventions, discoveries, and improvements by means of which physicians and surgeons are now enabled to study and treat disease so much more satisfactory and successfully than in former times. But one thing is now sure, that the x-ray is very good help to us, especially in bone-surgery and in cases where foreign objects have to be found in the human body, for such cases the value of this means of early and proper diagnosis can not be disputed any more—its beyond the experimental stage, and has to stay. Along the line of other good means of diagnosis, we must not introduce anything that would mislead, nor omit anything that can be of practical service to us. And the x-ray is one of the most practical things. The result of scientific progress and to us an application, which help us not only *to feel* a lesion, but *to see*. The "tactus erruditus" may be educated and practised to the highest point of development, but it can not replace the value of good vision. Just think of it, how the photography developed in the last decade of our times, and if I am not mistaken the shadow-picture of Napoleon Bonaparte is one of the best, as far as yet, the most acurate, the main foundation of many and many portraits of that great man. Shadow picture only! And what are the radiographs? Same, simple shadow pictures, which in our method of treatment of fractures, dislocations, etc., a greater revolution have wrought and gave us a simple means of diagnosis, diagnosis which is correct and easily may be proven. But we must not forget that we are dealing with shadows only, that one radiograph may not appear like the other one and that a slightest change in position may, in spite of perfect technique and thorough anitomical and pathological knowledge, produce grave errors of diagnosis. These errors are made very often, but the errors of

diagnosis by the old way are still greater. Then the trouble is that men who have purchased an x-ray outfit to-day consider themselves "experts" to-morrow and do more harm than good with their pictures (done without fluorometer or any other proof of accuracy.) I think that we should never be satisfied with one radiograph of a respective case, but make few radiographs from different positions and compare also the picture of the injured part with the normal one, using in every case a fluorometer. I went to work to study the means of diagnosis in cases of injury of the head and tried my best in experimenting to illustrate with comparatively very short exposures, the increasing efficiency of the Roentgen light.

But how easy an error could be made! The following case will illustrate the usefulness of the x-ray on one side and the danger of a mistake on the other. In reporting the case I fully realize that one or two cases are very little to build on, but let us see:

Joseph J. B., aged thirty-nine years, sunstroke six years ago. Since that time had complained of dull, persistent headache on the left side of the head; changed disposition, was irritable, had vertigo, dyspepsia, vomiting, soon followed by slight palsies, but no convulsions. Lately, retention of urine and symptoms more obscure. The tone of the muscles and intellect were unimpaired.

Patient brought to me for x-ray examination. With the parts of the head not examined covered with stanniol and those exposed shaved and oiled, I made about six radiographs. The first one revealed nothing special, but the last one showed plainly, under the parietal bone at the sagital suture on the left a large epidural clot. The clot amounting to four ounces, was removed, and recovery followed in three weeks without any complication. Spark used, twelve inches; distance of the tube from the object, ten inches; plate right behind; duration of exposure five seconds; angle at which the picture was taken, 36°; plate of tungstate of calcium over the dry plate to shorten the exposure; Wehnelt's interrupter used. Patient in elevated position; head low down.

This experience in one case shows plainly the necessity of always taking more than one radiograph in different positions. First picture was negative and pointed to a non-operative line of treatment together with the obscure symptoms; the last one gave us altogether different view of the status. I would not advocate giving up any of our methods of making diagnosis, but think that the application of the x-ray will be considered appropriate to confirm our diagnosis with all the evidence in each case, which may be procured for the benefit of our patient.

CEDAR RAPIDS, IA.

In the radiograph the abscess showed very distinct but in the half tone when reproduced on paper it lost the sharp definition of the clot.—Ed.

AMERICAN X-RAY JOURNAL, ST. LOUIS, MO.
HEBER ROBARTS, M. D., EDITOR.

ELDORA. IA., JANUARY 5, 1899.
EMERGENCY HOSPITAL.

Dear Doctor:—I enclose herewith my subscription to your journal. I have just returned from a trip East, including Cincinnati and your city, and desire to call your attention to a very important matter concerning the taking of skyagraphs which seem to be unknown to all the experts whom I have had the pleasure of visiting or conversing with, viz: While in the act of taking a skiagraph it is a simple matter to watch the impression made upon the plate (negative) or watch its formation by crawling under the table and placing the fluoroscope immediately against the under surface of table, and looking upwards. I always have my nurse or assistant make the observation and when the skyagraph or negative seems plain and distinct, the x-rays are discontinued. This not only

saves time but saves many negatives also and renders obsolete the question of seconds or minutes in making exposures.

Very truly yours,

N. C. MORSE, M. D.

Since the Wehnelt interrupter has been successfully employed to increase radiant energy with a coil the following matter taken from Vol. 1, No. II. of the American X-ray Journal may be of interest. The switch has been used very little with static machines.—Ed.

Within a few months following Prof. Roentgen's announcement of the x-ray phenomenon the editor of this journal had constructed a Tesla high-frequency coil for x-ray work. It was the first apparatus of the kind made for this purpose. Constant application of the instrument to fluoroscopy and skiagraphy revealed a want and imperfection in the picturing. It was this fault which caused us to conceive of a method for its improvement. The fluoroscope and switch in handle herein shown was made by an Eastern concern on receipt of the following from us:

St. Louis Mo., July 20, 1896.

L. E. KNOTT APPARATUS CO., Boston, Mass.

Gentlemen.—The power of the Roentgen rays is at present all that is required, but some method of utilizing it to better advantage is demanded.

Radiographic pictures as well as fluoroscopic views of the softer structures are essential.

It is impossible to get a good picture of a tumor, or of any consumptive area, or of any fleshy induration with any existing device. It also requires much study to differentiate with the fluoroscope diseased from healthy tissue in the interior of the body. This fault lies with the slow method of cutting off the electric current, which should be instantaneous. The cut-off should be under control of the operator, on the fluoroscope, and under the thumb. The picture, consciousness of it and interception of the current should be, as nearly as possible, simultaneous.

There should be a slide space in the outer fluorescent end of the fluoroscope for the purpose of receiving the sensitive plate. A perfect apparatus will excite a discharge tube which will readily cast a shadow of the softer tissues followed immediately by transparency, then a shadow of the denser structures, progressing in this way until all of the parts are lost. The view wanes before the sight not unlike the mellow receding rays of the northern lights.

With the improved method of cutting off the rays a picture of the internal structures is readily produced. When such a picture is brought well into view, cut off the current, slide in the sensitized plate, keeping the eyes still in the fluoroscope. When all is ready turn in the current. The picture will now soon appear in the fluoroscope, and at the same instant on the sensitized plate. This is the moment when loss of time destroys the picture. With some degree of care, combined with the instantaneous cut-off under the operator's control, a perfect picture can be obtained.

Yours truly, HEBER ROBARTS.

Since this was written, and since the

instrument has been put to actual test, we desire to retract some of the claims made for it. While it is a practical and valuable device, experience has proven the inadequateness of a sensitized plate to be affected by the x-rays at all times sufficient to make a picture at the moment of fluorescence. When the rays stream out in great quantity and force, a picture of denser structures in rapid succession dawn before the eyes, but the plates fail to respond to the outlines of softer tissue with the promptness suggested. The plate is not influenced as by light rays. Visible shadows upon tungstate of calcium or other fluorescent material has not been made to synchronize with a fixed shadow upon a sensitized plate.

NOTES.

BY J. HALL EDWARDS, M. D.

The "Princess of Wales" hospital ship which sailed for the Cape about the middle of December was provided with a special, portable, X-ray equipments manufactured by Messrs Harry W. Cox, Limited.

The coil which gives a nominal 10" spark was specially designed and constructed in conjunction with Dr. Hall-Edwards, Radiographer to the General Hospital, Birmingham, for Field Work Hospitals, Railway Companies and others requiring to carry the apparatus from one place to another.

This handy form of apparatus has been adopted by several of the hospital ships and I hear that the war office have ordered several for special service on the field. A 10" coil contained in a strong iron-bound case weighs less than 25 lbs.

"The Lancet" of December 23d contains an interesting contribution from Sir William MacCormac from the seat of war. He describes the excellent arrangements at the base hospital at Wynberg, eight miles from Capetown. A special room is set apart for x-ray work. Sir William speaks highly of the work of this department, and declares it to be fitted with the most modern apparatus. In describing the effects of the Mauser bullet, he says, that in three-fourths of the cases, if not even in a larger portion, it was impossible to tell the exits from the entrance wound and that it is exceedingly rare for the bullet to lodge in the body of the patient.

APPARATUS IN ACTUAL USE ON THE FIELD.

The "Roentgen Society" is fast growing

in popularity, a large number of new members having been recently elected. On February 1st, Dr. Hugh Walsham will read a paper on "Roentgen Rays in Diseases of the Chest" and on April 5th, Dr. Norris Wolfenden and Dr. Forbes Ross will give papers on "The Influence of the x-rays upon the Growth and Development of Micro organisms."

The British Medical Journal says: The sets of apparatus supplied for x-ray work in the field in South Africa may be pronounced to be complete and thoroughly up-to-date. Each set contains six focus tnbes; a 10-inch field service induction coil, with condenser and commutator; two pairs of conducting cords and four ebonite pillars packed in teak cases; two lithanode portable batteries, with six cells of 30 ampere-hours; one fluorescent screen with cryptoscope; a voltmeter; a stand for x-ray tubes; spare wires; a portable cross-frame localizer of Mr. Mackenzie Davidson's pattern, with stand and accessories; a stretcher with tube-holder and plate-holder; nine dozen Edwards's cathodal x x x plates of various sizes, material and apparatus for developing, printing paper and printing frames, and black and ruby fabric.

EXTRAORDINARY SURGICAL FEAT. -- A wonderful triumph in surgery, achieved by Dr. Hermann von Schrotter, of Vienna, is reported by the Daily Chronicle's correspondent in that city. A boy, aged twelve, had swallowed a piece of lead of the size of half a sovereign, which passing through the trachea, descended into a bronchus of the second order. Dr. Schrotter extracted this piece of lead without tracheotomy, and even without using anæsthetics; the operation was, nevertheless, quite plainless. First by means of the Roentgen rays the piece of lead was discovered located at the height of the fourth ib; then Killian's (Berlin) bronchoscope was in the ordinary way introduced into the trachea and electrically lighted up, and the piece of lead was at last extracted by a pincette expressly constructed for the purpose.

ANOTHER SURGICAL FEAT.—A correspondent states that near Arbroath a little girl swallowed a screw an inch and a half long. A surgical operation would have endangered the child's life. The doctor took some fine strands of raw silk and mixed them with some bread, which the girl was induced to swallow. He waited eight minutes for them to revolve in the stomach. Then he pulled up the threads, and the screw came out, having been enmeshed in the silk.

ANOTHER AID TO SURGERY.—The cinematograph seems likely to become as important a factor in surgery as the x-rays—at least for the purpose of lecturing it bids fair to become invaluable. Dr. Doyen, the famous French surgeon, last week gave a demonstration by its aid of his world-renowned rapid methods of surgery before the Gynæcological Society. So faithful was the reproduction that even had he not been there every step of the operations shown explained itself. The most difficult and delicate operations were performed before the very eyes of the audience, and it became very clear that as a method of instruction in surgery upon the living body the cinematograph would be the most valuable assistant yet discovered.

A NEW USE FOR ROENTGEN-RAY PHOTOGRAPHY.—In a paper lately read before the Royal Society by Messrs. C. T. Heycock, F. R. S., and F. H. Neville, F. R. S., they described a method of making photographs of sections of particular alloys of gold they were experimenting upon. It consisted in using Rontgen rays instead of taking a negative by reflected light. The negatives so obtained were enlarged. and, say, the writers, "the contrast between the Roentgen-ray photograph and the surface photograph of the same alloy shows what a much better picture of the structure of the alloy is given by the Rontgen rays."

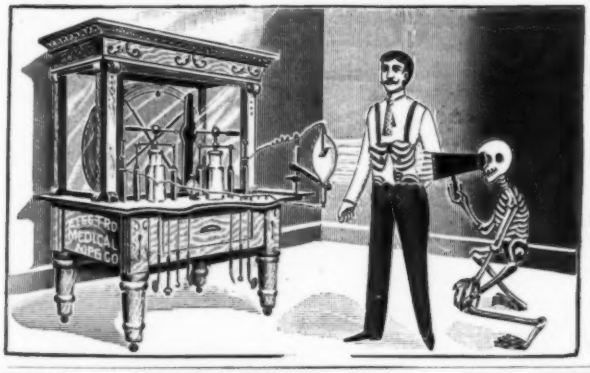
Treatment of a Case of Facial Neuralgia.

Bernays ("*Report of a Surgical Clinic*") cites a peculiarly obstinate case of facial neuralgia with treatment. The patent was a lady aged fifty years, who showed a good family history and whose previous health was also good. The trouble began with a severe neuralgic toothache of her lower right molars, and was paroxysmal at first, but after two months became continuous. The paroxysms generally occurred in the early morning, and entailed much acute suffering. The pain was relieved by biting strongly upon some firm object, but returned immediately when the pressure was removed. The touch of anything cold or hot promptly excited a paroxysm. A moderate heat when sustained produced the opposite effect. In the effort to afford relief four molars were extracted, but without success. The patient strenuously held out against the use of narcotics in any form throughout the entire course of the disease. Antikamnia in ten grain doses (two five-grain tablets) was found efficient as an obtundant, and was relied upon exclusively. Eight weeks after section of the nerve, when the report was written, there had been no return of her former trouble in any degree.—*The Medical News*, Jan. 13th.

Alterative Medication.

Henry (Medical Essays) points out the essentials of a successful tonic and alterative medicine. Such combination will ultimately fail if it is not well adapted to the demands of an extended course of treatment. Among facts which may be considered as most thoroughly established by clinical experience are the peculiar tonic and alterative value of the salts of of iron arsenic, and mercury. They promote appetite, digestion and assimilation, in a word are tonic, and improve the general condition of the system by correcting errors in fluids and functions, in other words are alterative. The combined action of these three drugs is three-fold and the action of one is supplementary of the others. He prefers the proto-chloride of iron which stimulates all the glands of the stomach and augments the blood making functions. This action is supplemented by the sedative and oxygen carrying power of arsenic and the intestine and liver stimulation of the bichloride of mercury. Besides all this when these remedies are properly combined, as in the elixer of the three chlorides (Henry), they do not disturb digestion, cause constipation or produce other unpleasant effects.

X-Ray Laboratory of Prof. W. O. Horner, Cleveland, Tenn.



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